A mass, M, sets on a scale located on the equator in Ecuador. Because of the rotation of the earth, the scale is at rest in an accelerated frame, and the mass' weight, Mg, will be altered by an amount (where \( R_E = 6.4 \times 10^6 \) m is the radius of the earth):

a) \(- MR_E \omega^2\)

b) \(+ MR_E \omega^2\)

c) \(- MR_E \omega^2/g\)

d) \(+ MR_E \omega^2/g\)

e) 0: The weight is unaffected.
A: Zero, because \( R = 0 \) at the North Pole.

Q: What would the effect be at the north pole?

\[ g = 10 \, \text{m/s}^2, \text{so the effect is small, (1/3)} \%
\]

\[ \text{and} \quad g = \frac{6.4 \times 10^6 \times (27 \times 24 \times 60 \times 60)}{2 \times 24 \times 60 \times 60} \approx 3.38 \times 10^{-2} \, \text{m/s}^2 \]

\[ (3.4 \times 10^{-3}) \, \text{m/s}^2 \]

Since \( \text{in magnitude,} \quad W = \frac{Mg}{2} \),

Therefore, the amount \( \Delta W = -W \), the scale must exert to keep the mass, \( M \), at rest.

The pseudo-force opposes the gravitational force, \( Mg \), which means upward at the equator. Thus, this terminating frame is

\[ F_{\text{pseudo}} = \frac{Mg}{2} \]

The pseudo-force acting on an object at rest in a rotating frame decreases slightly, as follows:

\[ \text{changes by an amount, } -W \]

L.e., it

The correct answer is (a); the weight